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|--|---|---|---------------------------------|---|--|--------------------------------------|
| NOTICE OF REVISION (NOR) | | | 1. DATE (YYMMDD) 94-11-04 | | Form Approved OMB No. 0704-0188 | |
| THIS REVISION DESCRIBED BELOW HAS BEEN AUTHORIZED FOR THE DOCUMENT LISTED. | | | | | | |
| <small>Public reporting burden for this collection is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503. PLEASE DO NOT RETURN YOUR COMPLETED FORM TO EITHER OF THESE ADDRESSED. RETURN COMPLETED FORM TO THE GOVERNMENT ISSUING CONTRACTING OFFICER FOR THE CONTRACT/ PROCURING ACTIVITY NUMBER LISTED IN ITEM 2 OF THIS FORM.</small> | | | | | | 2. PROCURING ACTIVITY NO. |
| | | | | | | 3. DODAAC |
| 4. ORIGINATOR | | b. ADDRESS (<i>Street, City, State, Zip Code</i>) Defense Electronics Supply Center 1507 Wilmington Pike Dayton, OH 45444-5270 | | 5. CAGE CODE 67268 | | 6. NOR NO. 5962-R028-95 |
| a. TYPED NAME (<i>First, Middle Initial, Last</i>) | | | | 7. CAGE CODE 67268 | | 8. DOCUMENT NO. 5962-89536 |
| 9. TITLE OF DOCUMENT MICROCIRCUITS, MEMORY, DIGITAL, CMOS, 1K X 9 FIFO, MONOLITHIC SILICON | | | 10. REVISION LETTER | | 11. ECP NO. N/A | |
| | | | a. CURRENT C | b. NEW D | | |
| 12. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES All | | | | | | |
| 13. DESCRIPTION OF REVISION Sheet 1: Revisions ltr column; add "D". Revisions description column; add "Changes in accordance with NOR 5962-R028-95". Revisions date column; add "94-11-04". Rev status of sheets; For sheets 1, and 13, add "D". Sheet 13: Delete in its entirety. Revision level block; add "D". | | | | | | |
| 14. THIS SECTION FOR GOVERNMENT USE ONLY | | | | | | |
| a. (<i>X one</i>) | X | (1) Existing document supplemented by the NOR may be used in manufacture. | | | | |
| | | (2) Revised document must be received before manufacturer may incorporate this change. | | | | |
| | | (3) Custodian of master document shall make above revision and furnish revised document. | | | | |
| b. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT DESC-ELDS | | | | c. TYPED NAME (<i>First, Middle Initial, Last</i>) DESC-ELDS | | |
| d. TITLE Chief, Microelectronics Branch | | e. SIGNATURE Michael A. Frye | | | f. DATE SIGNED (YYMMDD) 94-11-04 | |
| 15a. ACTIVITY ACCOMPLISHING REVISION DESC-ELDS | | b. REVISION COMPLETED (<i>Signature</i>) Gary L. Gross | | | c. DATE SIGNED (YYMMDD) 94-11-04 | |

| | | | | | |
|--|---|--|--|--|-------------------------|
| NOTICE OF REVISION (NOR) | | 1. DATE (YYMMDD) 94-05-10 | | Form Approved OMB No. 0704-0188 | |
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| | | | | 3. DODAAC | |
| 4. ORIGINATOR | | b. ADDRESS (Street, City, State, Zip Code) Defense Electronics Supply Center 1507 Wilmington Pike Dayton, OH 45444-5270 | | 5. CAGE CODE 67268 | |
| a. TYPED NAME (First, Middle Initial, Last) | | | | 7. CAGE CODE 67268 | |
| | | | | 6. NOR NO. 5962-R143-94 | |
| | | | | 8. DOCUMENT NO. 5962-89536 | |
| 9. TITLE OF DOCUMENT MICROCIRCUITS, MEMORY, DIGITAL, CMOS, 1K X 9 FIFO, MONOLITHIC SILICON | | | 10. REVISION LETTER | | 11. ECP NO. None |
| | | | a. CURRENT B | b. NEW C | |
| 12. CONFIGURATION ITEM (OR SYSTEM) TO WHICH ECP APPLIES | | | | | |
| 13. DESCRIPTION OF REVISION Sheet 1: Revisions ltr column; add "C". Revisions description column; add "Changes in accordance with NOR 5962-R143-94". Revisions date column; add "94-05-10". Revision level block; add "C". Rev status of sheets; For sheets 1, 14, and 18, add "A". Sheet 14: Figure 2, case outline row; delete "X and Y" and substitute "X, Y, and Z". Figure 2, case outline row; delete "Z" and substitute "U". Revision level block; add "C". Sheet 18: Figure 4, Empty flag from last read to first write; delete "DATA _{IN} " and substitute "DATA _{OUT} ". Revision level block; add "C". | | | | | |
| 14. THIS SECTION FOR GOVERNMENT USE ONLY | | | | | |
| a. (X one) | X | (1) Existing document supplemented by the NOR may be used in manufacture. | | | |
| | | (2) Revised document must be received before manufacturer may incorporate this change. | | | |
| | | (3) Custodian of master document shall make above revision and furnish revised document. | | | |
| b. ACTIVITY AUTHORIZED TO APPROVE CHANGE FOR GOVERNMENT DESC-ELDS | | | c. TYPED NAME (First, Middle Initial, Last) Michael A. Frye | | |
| d. TITLE MICROELECTRONICS BRANCH CHIEF | | e. SIGNATURE Michael A. Frye | | f. DATE SIGNED (YYMMDD) 94-05-10 | |
| 15a. ACTIVITY ACCOMPLISHING REVISION DESC-ELDS | | b. REVISION COMPLETED (Signature) Jeff Bowling | | c. DATE SIGNED (YYMMDD) 94-05-10 | |

| REVISIONS | | | |
|-----------|--|-----------------|------------|
| LTR | DESCRIPTION | DATE (YR-MO-DA) | APPROVED |
| B | Added device type 03. Add vendor CAGE OHGZ7 as a supplier of device types 01 through 04. Editorial changes throughout. | 93-09-17 | M. A. Frye |

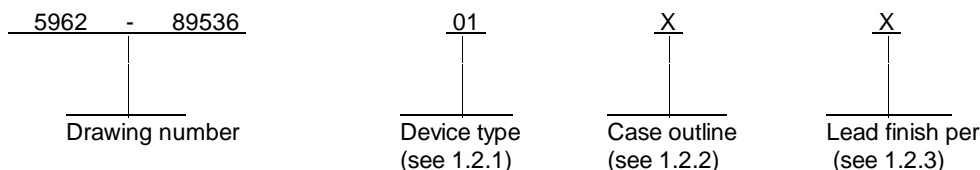
THE ORIGINAL FIRST PAGE OF THIS DRAWING HAS BEEN REPLACED.

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| SHEET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REV | A | A | A | A | A | A | B | A | A | | | | | | | | | | | | | | | | | | | | |
| SHEET | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | | | | | | | | | | | | | | | | | | | |
| REV STATUS OF SHEETS | | | | REV | | | B | B | A | A | B | B | B | B | B | B | B | A | A | | | | | | | | | | |
| | | | | SHEET | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | | | | | | | | |
| PMIC N/A | | | | PREPARED BY Kenneth Rice | | | | | | DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444 | | | | | | | | | | | | | | | | | | | |
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| | | | | APPROVED BY Monica L. Poelking | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | DRAWING APPROVAL DATE 27 March 1990 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | REVISION LEVEL B | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | SIZE A | | CAGE CODE 67268 | | | 5962-89536 | | | | | | | | | | | | | | | | | | | | |
| | | | | SHEET | | 1 | OF | | 23 | | | | | | | | | | | | | | | | | | | | |

1. SCOPE

1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part or Identifying Number (PIN). The complete PIN shall be as shown in the following example:



1.2.1 Device type(s). The device type(s) shall identify the circuit function as follows:

| <u>Device type</u> | <u>Generic number</u> | <u>Circuit</u> | <u>Access time</u> |
|--------------------|-----------------------|--------------------------|--------------------|
| 01 | (see 6.6) | 1k X 9-bit parallel FIFO | 120 ns |
| 02 | (see 6.6) | 1k X 9-bit parallel FIFO | 80 ns |
| 03 | (see 6.6) | 1k X 9-bit parallel FIFO | 65 ns |
| 04 | (see 6.6) | 1k X 9-bit parallel FIFO | 40 ns |
| 05 | (see 6.6) | 1k X 9-bit parallel FIFO | 30 ns |
| 06 | (see 6.6) | 1k X 9-bit parallel FIFO | 20 ns |

1.2.2 Case outline(s). The case outline(s) shall be as designated in MIL-STD-1835, and as follows:

| <u>Outline letter</u> | <u>Descriptive designator</u> | <u>Terminals</u> | <u>Package style</u> |
|-----------------------|-------------------------------|------------------|---|
| X | CDIP3-T28 or GDIP4-T28 | 28 | Dual-in-line package |
| Y | CDIP1-T28 or GDIP2-T28 | 28 | Dual-in-line package |
| Z | GDFP2-F28 | 28 | Flat package, configuration 1 |
| U | CQCC1-N32 | 32 | Rectangular leadless chip carrier package |

1.2.5 Lead finish. The lead finish shall be as specified in MIL-M-38510. Finish letter "X" shall not be marked on the microcircuit or its packaging. The "X" designation is for use in specifications when lead finishes A, B, and C are considered acceptable and interchangeable without preference.

1.3 Absolute maximum ratings.

| | |
|--|------------------------|
| Terminal voltage with respect to ground | -0.5 V dc to +7.0 V dc |
| DC output current | 50 mA |
| Storage temperature range | -65° C to +150° C |
| Maximum power dissipation | 1.0 W |
| Lead temperature (soldering, 10 seconds) | +260° C |
| Thermal resistance, junction-to-case (Θ_{JC}) | See MIL-STD-1835 |
| Junction temperature (T_J) | +150° C <u>1/</u> |

1.4 Recommended operating conditions.

| | |
|---|----------------------|
| Supply voltage range (V_{CC}) | 4.5 V dc to 5.5 V dc |
| Minimum high level input voltage (V_{IH}) | 2.2 V dc |
| Minimum low level input voltage (V_{IL}) | +0.8 V dc <u>2/</u> |
| Case operating temperature range (T_C) | -55° C to +125° C |

1/ Maximum junction temperature may be increased to + 175° C during burn-in and steady state life.

2/ 1.5 V undershoots are allowed for 10 ns once per cycle.

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2. APPLICABLE DOCUMENTS

2.1 Government specification, standards, bulletin, and bulletin. Unless otherwise specified, the following specifications, standards, and bulletin of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARDS

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.
MIL-STD-1835 - Microcircuit Case Outlines.

BULLETIN

MILITARY

MIL-BUL-103 - List of Standardized Military Drawings (SMD's).

(Copies of the specifications, standards, and bulletin required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.2 herein.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.3 Truth table(s). The truth table(s) shall be as specified on figure 2.

3.2.4 Die overcoat. Polyimide and silicone coatings are allowable as an overcoat on the die for alpha particle protection provided that each coated microcircuit inspection lot (see MIL-M-38510) shall be subjected to and pass the internal moisture content test, (test method 1018 of MIL-STD-883), the frequency of the internal water vapor testing may not be decreased unless approved by the preparing activity.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in table I and shall apply over the full case operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are defined in table I.

| | | | |
|---|------------------|----------------------------|-------------------|
| STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444 | SIZE A | | 5962-89536 |
| | | REVISION LEVEL A | SHEET 3 |

TABLE I. Electrical performance characteristics.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C V _{SS} = 0 V, 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|---------------------------------|------------------|---|----------------------|-----------------|--------|-----|------|
| | | | | | Min | Max | |
| Input leakage current | I _{LI} | 0.0 V ≤ V _{IN} ≤ V _{CC} | 1, 2, 3 | All | -10 | 10 | μA |
| Output leakage current | I _{LO} | 0.0 V ≤ V _{OUT} ≤ V _{CC} , $\bar{R} \geq V_{IH}$ | 1, 2, 3 | All | -10 | 10 | |
| Output low voltage | V _{OL} | V _{CC} = 4.5 V, I _{OL} = 8.0 mA V _{IL} = 0.8 V, V _{IH} = 2.2 V | 1, 2, 3 | All | | 0.4 | V |
| Output high voltage | V _{OH} | V _{CC} = 4.5 V, I _{OH} = -2.0 mA V _{IL} = 0.8 V, V _{IH} = 2.2 V | 1, 2, 3 | All | 2.4 | | |
| Operating supply current | I _{CC1} | f = maximum, outputs open V _{CC} = 5.5 V RS = FL / RT = V _{IH} | 1, 2, 3 | 01-03 | | 100 | mA |
| | | f = 20 MHz, outputs open V _{CC} = 5.5 V | | 04-06 | | 140 | |
| Standby power supply current | I _{CC2} | $\bar{R} = \bar{W} = \bar{RS} = \bar{FL} / \bar{RT} = V_{IH}$ Output open, f = 0 MHz | 1, 2, 3 | 01-03 | | 15 | mA |
| | | | | 04-06 | | 20 | |
| Power down current | I _{CC3} | All inputs = V _{CC} - 0.2 V, Outputs open, f = 0 MHz | 1, 2, 3 | All | | 900 | μA |
| Input capacitance | C _{IN} | V _I = 0 V, f = 1.0 Mhz, T _A = +25°C, see 4.3.1c | 4 | All | | 8.0 | pF |
| Output capacitance | C _{OUT} | V _I = 0 V, f = 1.0 Mhz, T _A = +25°C, see 4.3.1c | 4 | All | | 8 | pF |
| Functional test | | See 4.3.1d | 7, 8A, 8B | All | | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C V _{SS} = 0 V, 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|--|------------------------|---|----------------------|-----------------|--------|-----|------|
| | | | | | Min | Max | |
| Read cycle time | t _{RC} | C _L = 30 pF See figure 4 and 5 | 9, 10, 11 | 01 | 140 | | ns |
| | | | | 02 | 100 | | |
| | | | | 03 | 80 | | |
| | | | | 04 | 50 | | |
| | | | | 05 | 40 | | |
| | | | | 06 | 30 | | |
| Access time | t _A | | 9, 10, 11 | 01 | | 120 | ns |
| | | | | 02 | | 80 | |
| | | | | 03 | | 65 | |
| | | | | 04 | | 40 | |
| | | | | 05 | | 30 | |
| | | | | 06 | | 20 | |
| Read recovery time | t _{RR} | 9, 10, 11 | 01, 02 | 20 | | ns | |
| | | | 03 | 15 | | | |
| | | | 04-06 | 10 | | | |
| Read pulse width | t _{RPW} | 9, 10, 11 | 01 | 120 | | ns | |
| | | | 02 | 80 | | | |
| | | | 03 | 65 | | | |
| | | | 04 | 40 | | | |
| | | | 05 | 30 | | | |
| | | | 06 | 20 | | | |
| Read pulse low to data bus at low Z | t _{RLZ} 1/ | 9, 10, 11 | 01-03 | 10 | | ns | |
| | | | 04-06 | 5 | | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C V _{SS} = 0 V, 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|--|----------------------------------|---|----------------------|-----------------|--------|-----|------|
| | | | | | Min | Max | |
| Write pulse high to data bus at low Z | t _{WLZ} <u>1/ 2/</u> | C _L = 30 pF See figure 4 and 5 | 9, 10, 11 | 01, 02 | 20.0 | | ns |
| | | | | 03 | 15 | | |
| | | | | 04 | 10 | | |
| | | | | 05, 06 | 5.0 | | |
| Data valid from read pulse high | t _{DV} | | 9, 10, 11 | All | 5.0 | | ns |
| Read pulse high to data bus at high Z | t _{RHZ} <u>1/</u> | | 9, 10, 11 | 01 | | 35 | ns |
| | | | | 02, 03 | | 30 | |
| | | | | 04 | | 25 | |
| | | | | 05 | | 20 | |
| | | | | 06 | | 15 | |
| Write cycle time | t _{WC} | | 9, 10, 11 | 01 | 140 | | ns |
| | | | | 02 | 100 | | |
| | | | | 03 | 80 | | |
| | | | | 04 | 50 | | |
| | | | | 05 | 40 | | |
| | | | | 06 | 30 | | |
| Write pulse width | t _{WPW} | | 9, 10, 11 | 01 | 120 | | ns |
| | | | | 02 | 80 | | |
| | | | | 03 | 65 | | |
| | | | | 04 | 40 | | |
| | | | | 05 | 30 | | |
| | | | | 06 | 20 | | |
| Write recovery time | t _{WR} | | 9, 10, 11 | 01, 02 | 20 | | ns |
| | | | | 03 | 15 | | |
| | | | | 04-06 | 10 | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C V _{SS} = 0 V, 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|---------------------|------------------|---|----------------------|-----------------|--------|-----|------|
| | | | | | Min | Max | |
| Data setup time | t _{DS} | C _L = 30 pF, See figure 4 and 5 | 9, 10, 11 | 01, 02 | 40 | | ns |
| | | | | 03 | 30 | | |
| | | | | 04 | 20 | | |
| | | | | 05 | 18 | | |
| | | | | 06 | 12 | | |
| Data hold time | t _{DH} | | 9, 10, 11 | 01-03 | 10 | | ns |
| | | | | 04-06 | 0.0 | | |
| Reset cycle time | t _{RSC} | | 9, 10, 11 | 01 | 140 | | ns |
| | | | | 02 | 100 | | |
| | | | | 03 | 80 | | |
| | | | | 04 | 50 | | |
| | | | | 05 | 40 | | |
| | | | | 06 | 30 | | |
| Reset pulse width | t _{RS} | | 9, 10, 11 | 01 | 120 | | ns |
| | | | | 02 | 80 | | |
| | | | | 03 | 65 | | |
| | | | | 04 | 40 | | |
| | | | | 05 | 30 | | |
| | | | | 06 | 20 | | |
| Reset recovery time | t _{RSR} | | 9, 10, 11 | 01, 02 | 20 | | ns |
| | | | | 03 | 15 | | |
| | | | | 04-06 | 10 | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C V _{SS} = 0 V, 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|--------------------------|--------------------------------|---|----------------------|-----------------|--------|-----|------|
| | | | | | Min | Max | |
| Reset setup time | t _{RSS} <u>1</u> / | C _L = 30 pF See figure 4 and 5 | 9, 10, 11 | 01 | 120 | | ns |
| | | | | 02 | 80 | | |
| | | | | 03 | 65 | | |
| | | | | 04 | 40 | | |
| | | | | 05 | 30 | | |
| | | | | 06 | 20 | | |
| Retransmit cycle time | t _{RTC} | | 9, 10, 11 | 01 | 140 | | ns |
| | | | | 02 | 100 | | |
| | | | | 03 | 80 | | |
| | | | | 04 | 50 | | |
| | | | | 05 | 40 | | |
| | | | | 06 | 30 | | |
| Reytransmit pulse width | t _{RT} | | 9, 10, 11 | 01 | 120 | | ns |
| | | | | 02 | 80 | | |
| | | | | 03 | 65 | | |
| | | | | 04 | 40 | | |
| | | | | 05 | 30 | | |
| | | | | 06 | 20 | | |
| Retransmit recovery time | t _{RTR} | 9, 10, 11 | 01, 02 | 20 | | ns | |
| | | | 03 | 15 | | | |
| | | | 04-06 | 10 | | | |
| Reset to empty flag low | t _{EFL} | 9, 10, 11 | 01 | | 140 | ns | |
| | | | 02 | | 100 | | |
| | | | 03 | | 80 | | |
| | | | 04 | | 50 | | |
| | | | 05 | | 40 | | |
| | | | 06 | | 30 | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - C9ontinued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C V _{SS} = 0 V, 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|--|--|---|----------------------|-----------------|--------|-----|------|
| | | | | | Min | Max | |
| Read low to empty flag low | t _{REF} | C _L = 30 pF See figure 4 and 5 | 9, 10, 11 | 01- 03 | | 60 | ns |
| | | | | 04, 05 | | 30 | |
| | | | | 06 | | 20 | |
| Read high to full flag high | t _{REF} | | 9, 10, 11 | 01 - 03 | | 60 | ns |
| | | | | 04 | | 35 | |
| | | | | 05 | | 30 | |
| | | | | 06 | | 20 | |
| Write high to empty flag high | t _{WEF} | | 9, 10, 11 | 01- 03 | | 60 | ns |
| | | | | 04 | | 35 | |
| | | | | 05 | | 30 | |
| | | | | 06 | | 20 | |
| Write low to full flag low | t _{WFF} | | 9, 10, 11 | 01- 03 | | 60 | ns |
| | | | | 04 | | 35 | |
| | | | | 05 | | 30 | |
| | | | | 06 | | 20 | |
| Reset to half full and full flag high | t _{HFH} , t _{FFH} | | 9, 10, 11 | 01 | | 140 | ns |
| | | | | 02 | | 100 | |
| | | | | 03 | | 80 | |
| | | 04 | | | 50 | | |
| | | 05 | | | 40 | | |
| | | 06 | | | 30 | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55°C ≤ T _C ≤ +125°C V _{SS} = 0 V, 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|-------------------------------------|------------------|---|----------------------|-----------------|--------|-----|------|
| | | | | | Min | Max | |
| Read/ write to \overline{XO} low | t _{XOL} | C _L = 30 pF See figure 4 and 5 | 9, 10, 11 | 01 | | 120 | ns |
| | | | | 02 | | 80 | |
| | | | | 03 | | 65 | |
| | | | | 04 | | 40 | |
| | | | | 05 | | 30 | |
| | | | | 06 | | 20 | |
| Read/ write to \overline{XO} high | t _{XOH} | | 9, 10, 11 | 01 | | 120 | ns |
| | | | | 02 | | 80 | |
| | | | | 03 | | 65 | |
| | | | | 04 | | 40 | |
| | | | | 05 | | 30 | |
| | | | | 06 | | 20 | |
| \overline{XT} pulse width | t _{XI} | | 9, 10, 11 | 01 | 120 | | ns |
| | | | | 02 | 80 | | |
| | | | | 03 | 65 | | |
| | | | | 04 | 40 | | |
| | | | | 05 | 30 | | |
| | | | | 06 | 20 | | |
| \overline{XT} recovery time | t _{XIR} | 9, 10, 11 | All | 10 | | ns | |
| \overline{XT} setup time | t _{XIS} | 9, 10, 11 | 01- 03 | 15 | | ns | |
| | | | 04 - 06 | 10 | | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions -55° C ≤ T _C ≤ +125° C V _{SS} = 0 V, 4.5 V ≤ V _{CC} ≤ 5.5 V unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|---|----------------------------|---|----------------------|-----------------|--------|-----|------|
| | | | | | Min | Max | |
| Retransmit setup time | t _{RTS} 1/ | C _L = 30 pF See figure 4 and 5 | 9, 10, 11 | 01 | 120 | | ns |
| | | | | 02 | 80 | | |
| | | | | 03 | 65 | | |
| | | | | 04 | 40 | | |
| | | | | 05 | 30 | | |
| | | | | 06 | 20 | | |
| Read pulse width after $\overline{\text{EF}}$ high | t _{RPE} | | 9, 10, 11 | 01 | 120 | | ns |
| | | | | 02 | 80 | | |
| | | | | 03 | 65 | | |
| | | | | 04 | 40 | | |
| | | | | 05 | 30 | | |
| | | | | 06 | 20 | | |
| Write low to half-full flag low | t _{WHF} | 9, 10, 11 | 01 | | 140 | ns | |
| | | | 02 | | 100 | | |
| | | | 03 | | 80 | | |
| | | | 04 | | 50 | | |
| | | | 05 | | 40 | | |
| | | | 06 | | 30 | | |
| Read high to half-full flag high | t _{RHF} | 9, 10, 11 | 01 | | 140 | ns | |
| | | | 02 | | 100 | | |
| | | | 03 | | 80 | | |
| | | | 04 | | 50 | | |
| | | | 05 | | 40 | | |
| | | | 06 | | 30 | | |

See footnotes at end of table.

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TABLE I. Electrical performance characteristics - Continued.

| Test | Symbol | Conditions $-55^{\circ}\text{C} \leq T_C \leq +125^{\circ}\text{C}$ $V_{SS} = 0\text{ V}, 4.5\text{ V} \leq V_{CC} \leq 5.5\text{ V}$ unless otherwise specified | Group A subgroups | Device types | Limits | | Unit |
|------------------------------------|--------|---|----------------------|-----------------|--------|-----|------|
| | | | | | Min | Max | |
| Write pulse width after EF high | | $C_L = 30\text{ pF}$ See figure 4 and 5 | 9, 10, 11 | 01 | 120 | | ns |
| | | | | 02 | 80 | | |
| | | | | 03 | 65 | | |
| | | | | 04 | 40 | | |
| | | | | 05 | 30 | | |
| | | | | 06 | 20 | | |

1/ If not tested, shall be guaranteed to the limits specified in table I.

2/ Only applies to read data flow-through mode.

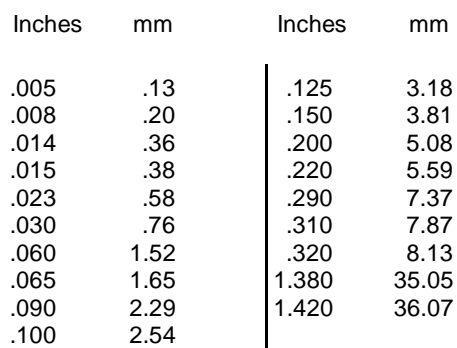
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1. Dimensions are in inches.
2. Metric equivalents are given for general information only.

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| Device types | All | |
|-----------------|------------------|------------------|
| Case outlines | X and Y | Z |
| Terminal number | Terminal symbol | |
| 1 | \bar{W} | NC |
| 2 | D ₈ | \bar{W} |
| 3 | D ₃ | D ₈ |
| 4 | D ₂ | D ₃ |
| 5 | D ₁ | D ₂ |
| 6 | D ₀ | D ₁ |
| 7 | $\bar{X}\bar{I}$ | D ₀ |
| 8 | $\bar{F}\bar{F}$ | $\bar{X}\bar{I}$ |
| 9 | Q ₀ | $\bar{F}\bar{F}$ |
| 10 | Q ₁ | Q ₀ |
| 11 | Q ₂ | Q ₁ |
| 12 | Q ₃ | NC |
| 13 | Q ₈ | Q ₂ |
| 14 | GND | Q ₃ |
| 15 | R | Q ₈ |
| 16 | Q ₄ | GND |
| 17 | Q ₅ | NC |
| 18 | Q ₆ | R |
| 19 | Q ₇ | Q ₄ |
| 20 | XO/HF | Q ₅ |
| 21 | EF | Q ₆ |
| 22 | $\bar{R}\bar{S}$ | Q ₇ |
| 23 | FL/RT | XO/HF |
| 24 | D ₇ | EF |
| 25 | D ₆ | $\bar{R}\bar{S}$ |
| 26 | D ₅ | FL/RT |
| 27 | D ₄ | NC |
| 28 | V _{CC} | D ₇ |
| 29 | --- | D ₆ |
| 30 | --- | D ₅ |
| 31 | --- | D ₄ |
| 32 | --- | V _{CC} |

NC = no connection

FIGURE 2. Terminal connections .

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Reset and retransmit
single device configuration/width expansion mode

| Mode | Inputs | | | Internal status | | Outputs | | |
|------------|-----------------|-----------------|-----------------|-------------------------|-------------------------|-----------------|-----------------|-----------------|
| | \overline{RS} | \overline{RT} | \overline{XT} | Read pointer | Write pointer | \overline{EF} | \overline{FF} | \overline{HF} |
| Reset | 0 | X | 0 | Location zero | Location zero | 0 | 1 | 1 |
| Retransmit | 1 | 0 | 0 | Location zero | Unchanged | X | X | X |
| Read/Write | 1 | 1 | 0 | Increment $\frac{1}{2}$ | Increment $\frac{1}{2}$ | X | X | X |

$\frac{1}{2}$ Pointer will increment if flag is high.

Reset and first load
depth expansion/compound expansion mode

| Mode | Inputs | | | Internal status | | Outputs | |
|-------------------------|-----------------|-----------------|-----------------|-----------------|---------------|-----------------|-----------------|
| | \overline{RS} | \overline{FL} | \overline{XT} | Read pointer | Write pointer | \overline{EF} | \overline{FF} |
| Reset first device | 0 | 0 | $\frac{1}{2}$ | Location zero | Location zero | 0 | 1 |
| Reset all other devices | 0 | 1 | $\frac{1}{2}$ | Location zero | Location zero | 0 | 1 |
| Read / write | 1 | X | $\frac{1}{2}$ | X | X | X | X |

$\frac{1}{2}$ \overline{XT} is connected to \overline{XO} of previous device.

NOTE: \overline{RS} = Reset input, $\overline{FL}/\overline{RT}$ = First load / retransmit
 \overline{EF} = Empty flag output, \overline{FF} = Full flag output, \overline{XT} = Expansion input,
and \overline{HF} = Half-full flag output
0 = Low level voltage
1 = High level voltage
X = Don't care

FIGURE 3. Truth tables.

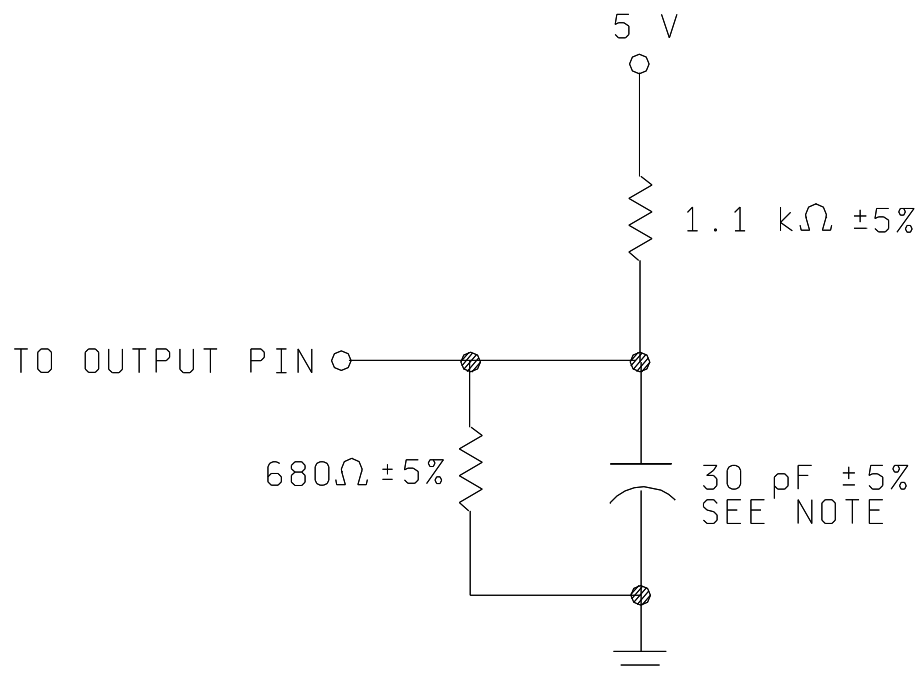
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NOTE: C_L include scope and jig capacitance

AC test conditions

| | |
|-------------------------------|--------------|
| Input pulse levels | GND to 3.0 V |
| Input rise and fall times | ≤ 5 ns |
| Input timing reference levels | 1.5 V |
| Output reference levels | 1.5 V |

FIGURE 4. Output load circuit and ac test conditions.

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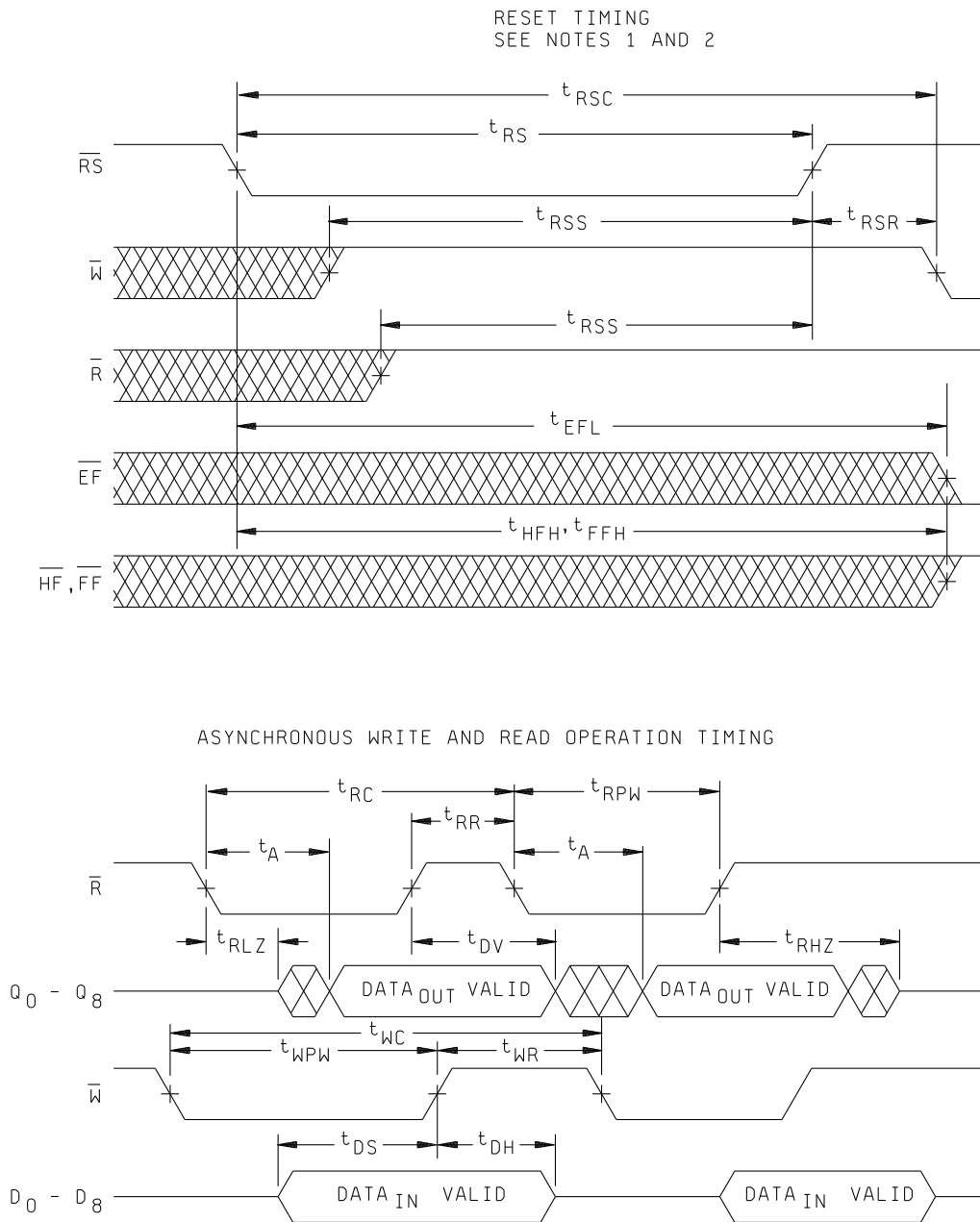


FIGURE 5. Timing waveforms.

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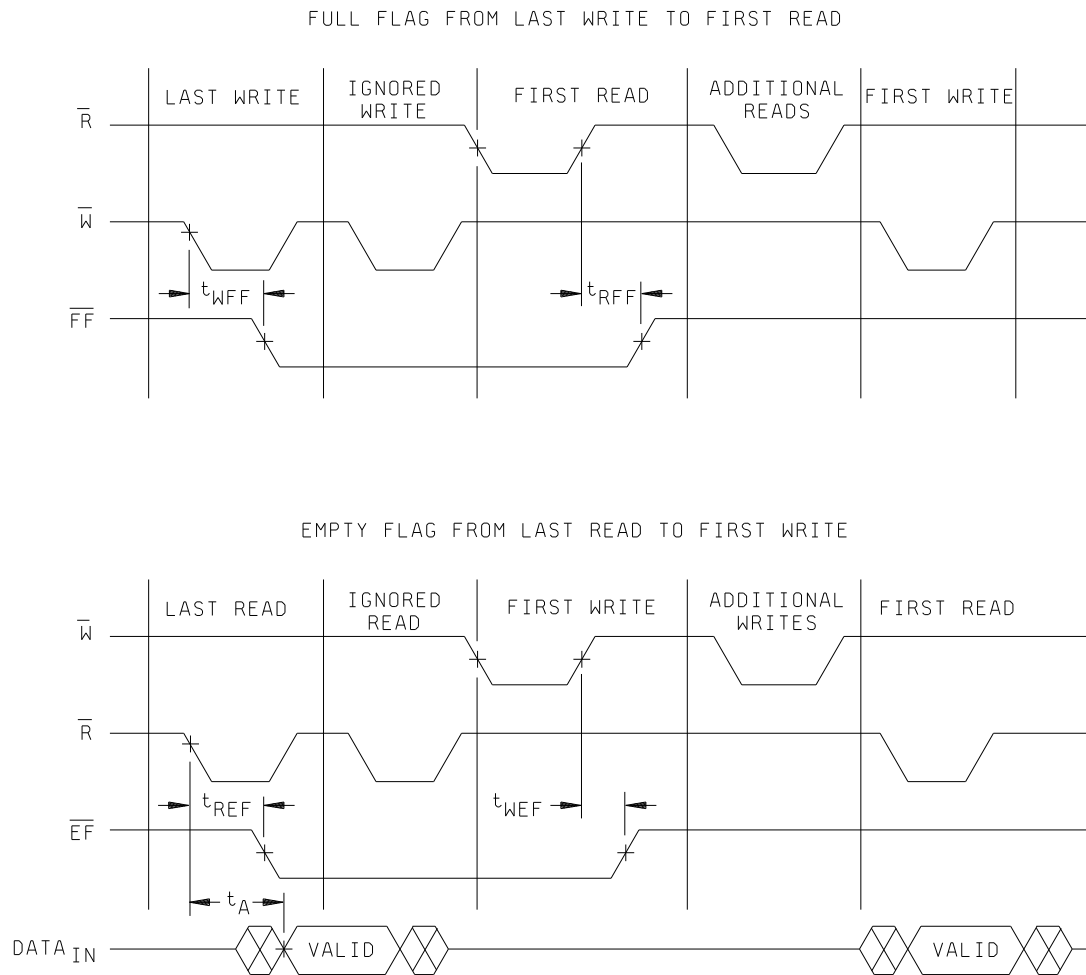


FIGURE 5. Timing waveforms - Continued.

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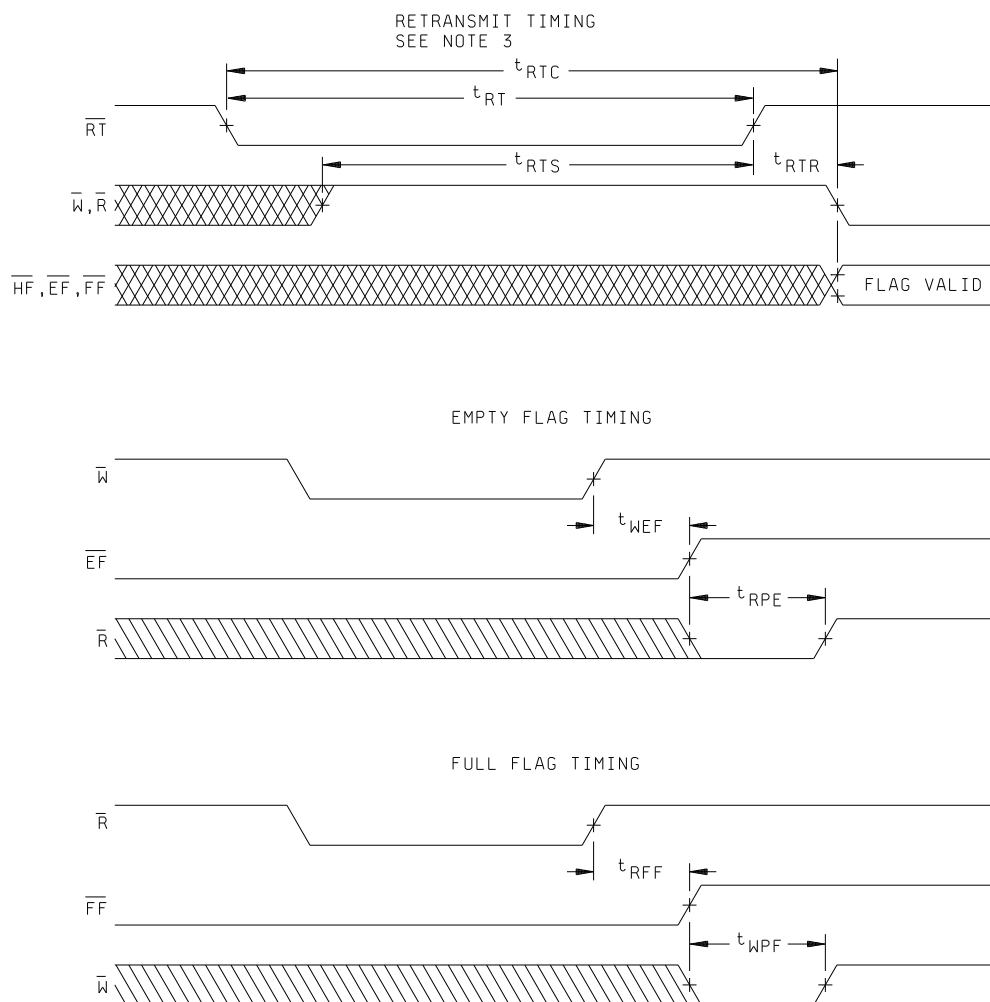


FIGURE 5. Timing waveforms - Continued.

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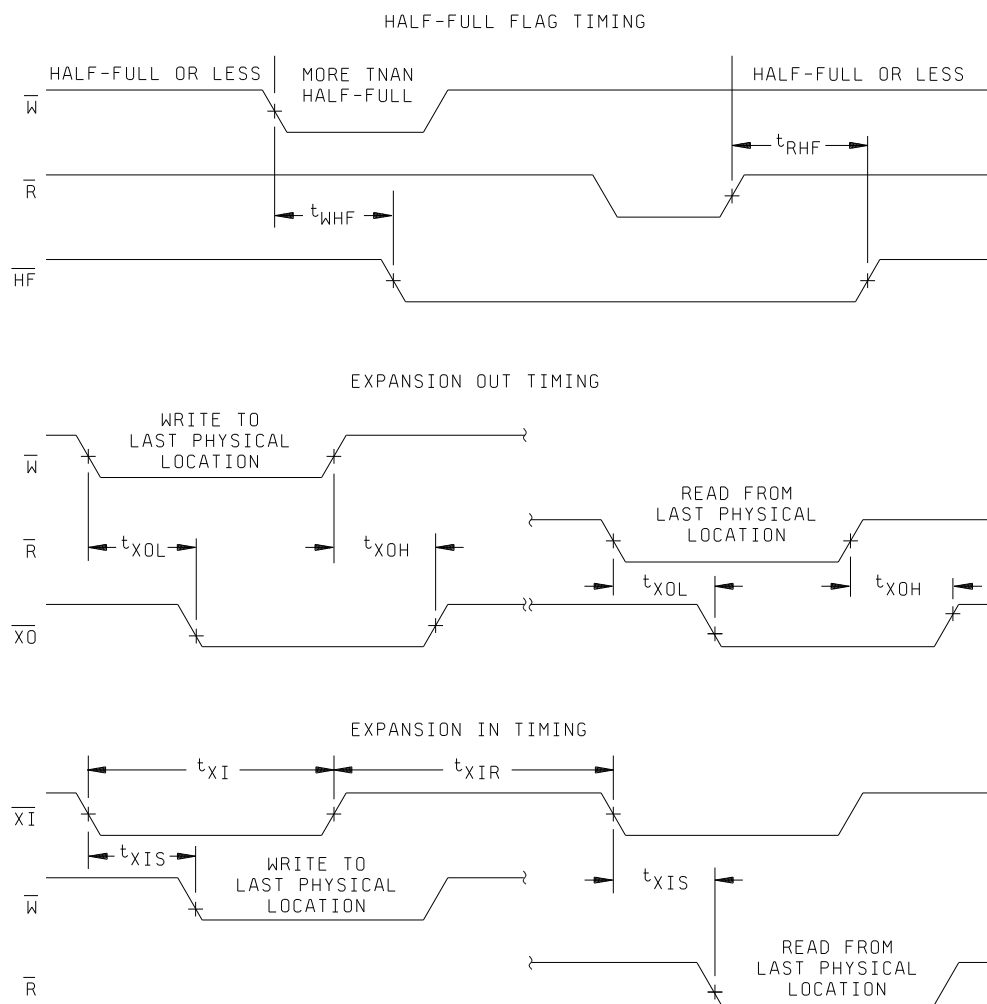


FIGURE 5. Timing waveforms - Continued.

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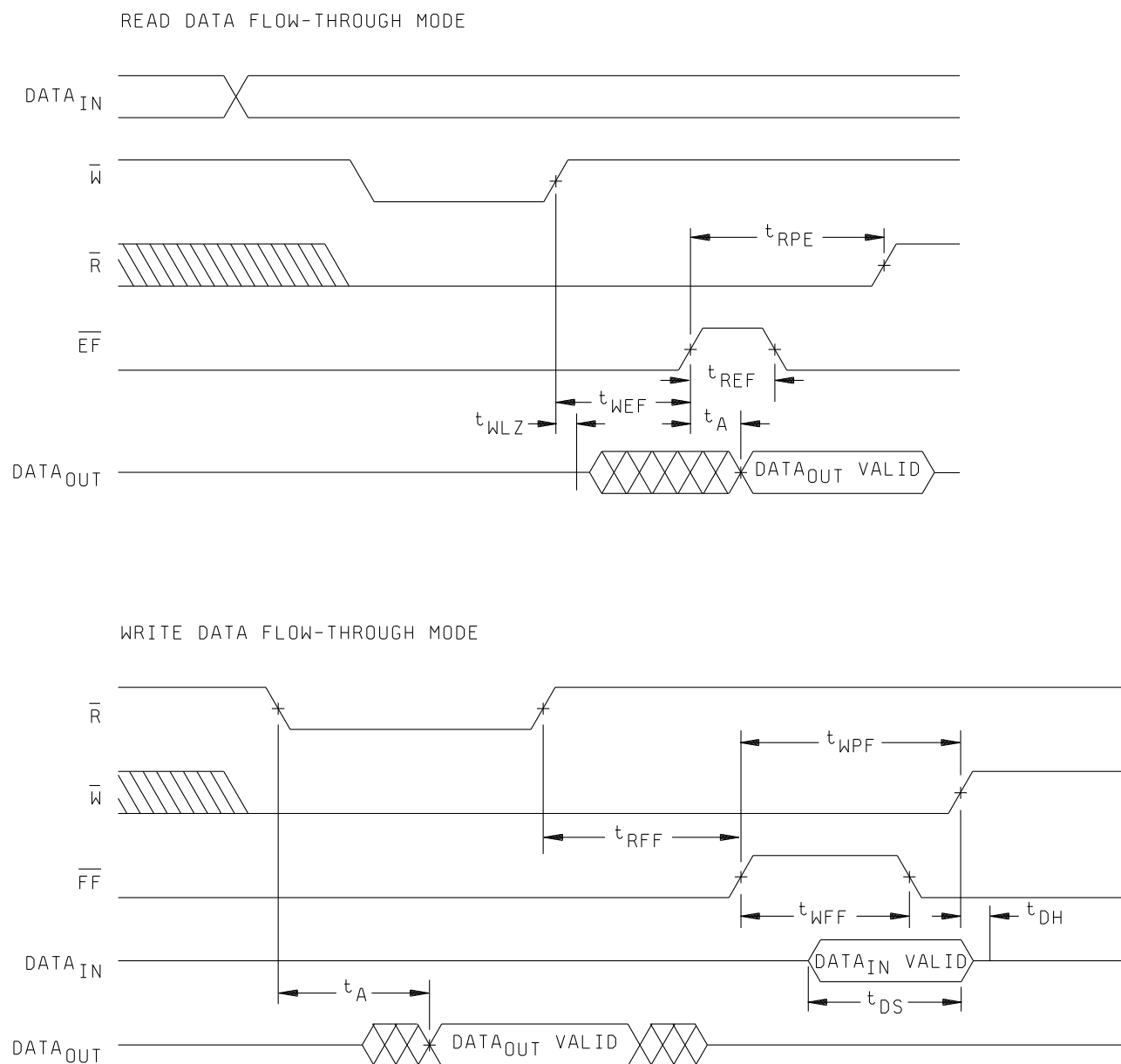


FIGURE 5. Timing waveforms - Continued.

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3.5 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in MIL-BUL-103 (see 6.6 herein).

3.6 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-BUL-103 (see 6.6 herein). The certificate of compliance submitted to DESC-EC prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change. Notification of change to DESC-EC shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.9 Verification and review. DESC, DESC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-STD-883 (see 3.1 herein).

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition C or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1015 of MIL-STD-883.

(2) $T_A = +125^\circ\text{C}$, minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

TABLE II. Electrical test requirements.

| MIL-STD-883 test requirements | Subgroups (in accordance with 5005, table I) |
|--|---|
| Interim electrical parameters (method 5004) | --- |
| Final electrical test parameters (method 5004) | 1*, 2, 3, 7*, 8A, 8B, 9, 10, 11 |
| Group A test requirements (method 5004) | 1, 2, 3, 4**, 7, 8A, 8B, 9, 10, 11 |
| Group C and D end-point electrical parameters (method 5005) | 2, 3, 7, 8A, 8B |

* PDA applies to subgroups 1.

** See 4.3.1c.

| | | | |
|---|-------------------|-----------------------------|---------------------|
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4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

4.3.1 Group A inspection.

- a. Tests shall be as specified in table II herein.
- b. Subgroups 5 and 6 in table I, method 5005 of MIL-STD-883 shall be omitted.
- c. Subgroup 4 (C_{IN} measurement) shall be measured only for the initial test and after process or design changes which may affect input capacitance.
- d. Subgroups 7 and 8 shall include verification of the truth table.

4.3.2 Groups C and D inspections.

- a. End-point electrical parameters shall be as specified in table II herein.
- b. Steady-state life test conditions, method 1005 of MIL-STD-883.
 - (1) Test condition C or D. The test circuit shall be maintained by the manufacturer under document revision level control and shall be made available to the preparing or acquiring activity upon request. The test circuit shall specify the inputs, outputs, biases, and power dissipation, as applicable, in accordance with the intent specified in test method 1005 of MIL-STD-883.
 - (2) $T_A = +125^\circ \text{C}$, minimum.
 - (3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for original equipment manufacturer application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-481 using DD Form 1693, Engineering Change Proposal (Short Form).

6.4 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and the applicable SMD. DESC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronics devices (FSC 5962) should contact DESC-EC, telephone (513) 296-6047.

6.5 Comments. Comments on this drawing should be directed to DESC-EC, Dayton, Ohio 45444, or telephone (513) 296-5377.

6.6 Approved sources of supply. Approved sources of supply are listed in MIL-BUL-103. The vendors listed in MIL-BUL-103 have agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DESC-EC.

| | | | |
|---|------------------|----------------------------|--------------------|
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STANDARDIZED MILITARY DRAWING SOURCE APPROVAL BULLETIN

DATE : 93-09-17

Approved sources of supply for SMD 5962-89536 are listed below for immediate acquisition only and shall be added to MIL-BUL-103 during the next revision. MIL-BUL-103 will be revised to include the addition or deletion of sources. The vendors listed below have agreed to this drawing and a certificate of compliance has been submitted to and accepted by DESC-EC. This bulletin is superseded by the next dated revision of MIL-BUL-103.

| Standardized military drawing PIN | Vendor CAGE number | Vendor similar PIN <u>1/</u> |
|-----------------------------------|--------------------|------------------------------------|
| 5962-8953601XX | 61772 OHGZ7 | IDT7202LA120TDB MM1P-67202-55MB |
| 5962-8953601YX | 61772 | IDT7202LA120DB |
| 5962-8953601ZX | 61772 | IDT7202LA120XEB |
| 5962-8953601UX | 61772 OHGZ7 | IDT7202LA120LB MM4J-67202-55MB |
| 5962-8953602XX | 61772 OHGZ7 | IDT7202LA80TDB MM1P-67202-55MB |
| 5962-8953602YX | 61772 | IDT7202LA80DB |
| 5962-8953602ZX | 61772 | IDT7202LA80XEB |
| 5962-8953602UX | 61772 OHGZ7 | IDT7202LA80LB MM4J-67202-55MB |
| 5962-8953603XX | 61772 OHGZ7 | IDT7202LA65TDB MM1P-67202-45MB |
| 5962-8953603YX | 61772 | IDT7202LA65DB |
| 5962-8953603ZX | 61772 | IDT7202LA65XEB |
| 5962-8953603UX | 61772 OHGZ7 | IDT7202LA65LB MM4J-67202-45MB |
| 5962-8953604XX | 61772 OHGZ7 | IDT7202LA40TDB MM1P-67202-35MB |
| 5962-8953604YX | 61772 | IDT7202LA40DB |
| 5962-8953604ZX | 61772 | IDT7202LA40XEB |
| 5962-8953604UX | 61772 OHGZ7 | IDT7202LA40LB MM4J-67202-35MB |
| 5962-8953605XX | 61772 | IDT7202LA30TDB |
| 5962-8953605YX | 61772 | IDT7202LA30DB |
| 5962-8953605ZX | 61772 | IDT7202LA30XEB |
| 5962-8953605UX | 61772 | IDT7202LA30LB |
| 5962-8953606XX | 61772 | IDT7202LA20TDB |
| 5962-8953606YX | 61772 | IDT7202LA20DB |
| 5962-8953606ZX | 61772 | IDT7202LA20XEB |
| 5962-8953606UX | 61772 | IDT7202LA20LB |

1/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

Vendor CAGE

number

61772

OHGZ7

Vendor name
and address

Integrated Device Technology, Incorporated
2975 Stender Way
Santa Clara, CA 95054-8015

Matra-MHS
2201 Laurelwood Road
Santa Clara, CA 95056-0951

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